Macewen, William, THE GROWTH AND SHEDDING OF THE ANTLER OF THE DEER. THE HISTOLOGICAL PHENOMENA AND THEIR RELATION TO THE GROWTH OF BONE. Glasgow: Maclehose, Jackson & Co., publishers to the University. Pp. i–xvii, 1–109, with 109 half-tone figures. 1920.

This beautifully illustrated volume is of as great value to the anatomist as to any one interested in deer. For the first time we have an anatomical treatise on the growth and shedding of the deciduous antler of the deer. This important investigation deals in detail with the histological changes which take place in the growing antler; it adds much to our understanding of the process of shedding of the antlers and explains their phenomenal growth.

Nowhere among animals do we find such an enormous and rapid reproduction of all the elements of the skin as in the growing velvet of the deer, which may cover the largest palmate antler within three months. The blood vessels in the velvet, which also form in a surprisingly short time, maintain the temperature of the growing bone within the hairy covering. These vessels anastomose but little with those of the underlying bone. The osseous growth of the antler is so rapid that the different phases of bone development may occur coincidentally. From the very beginning of antler formation there is going on a preparation for shedding. The latter is caused by the constricting of the blood vessels within the antler, particularly at the base, through the rapid proliferation of the bony tissue around them, which is followed by necrosis. Prior to the shedding, the bone on the distal end of the pedicle becomes softened, blood vessels within the pedicle increase in number and size, and granulation tissue is formed which loosens the connection between the dead antler and the pedicle. The shedding of the velvet, which precedes that of the antler, is likewise provided for in early stages of its growth. The bony substance emanating from the pedicle overlaps the latter, even in the sprouting antler, and forms the corona. The corona sends at first bony projections between the blood vessels of the velvet, which thus lie well protected in grooves. Gradually, however, these vessels are compressed and ultimately strangled by the advancement of ossification in the corona. The whole cutis then dries and peels off. The abundant multiplication of the bony cells in the growing antler, which are derived from the osteoblasts in the pedicle, can hardly be explained by normal cell division alone. The process known as nuclear budding may also partly account for this rapid production in ossification. During the growing period the antler is capable of repair after injury; at this time the pedicle is full of blood, which it transmits to the interior of the antler. After the termination of its development, the antler, no doubt, dies. The pedicle, however, must at all times be in active life, and preparing for the production of a new antler immediately after the shedding of the old one.

In addition to these normal conditions, the effect of injury to and disease of the pedicle and of castration on the growth of antlers is discussed in this much needed book.

—*A. H. Schultz.*

Krieg, H. UEBER DIE BILDUNG VON STREIFENZEICHNUNGEN BEI SÄUGETIEREN. Anatom. Anz., vol. 54, pp. 33–40. 1921.

A preliminary report of investigations on the causes and origin of the stripe-distribution in the mammalian skin. Three principal types of arrangement are

distinguished: (1) Vertical stripes on the trunk, circular ones on the extremities, and stripes forming acute angles in the regions where those of the trunk and extremities meet and on the forehead and cheeks, e.g. Grèvy zebra. (2) Longitudinal stripes on the trunk, as in some young wild swine and in tapirs. This is a primitive type and is frequently found in combination with type 1. (3) Vertical stripes of the trunk extending to the extremities, which have no circular stripes. This type is restricted to some domesticated animals and never occurs in wild forms. The arrangement of stripes varies greatly within the same species and even in the two halves of the body. The author attempts to correlate the stripes with the folds in the skin at various stages of growth. The arrangement and direction of skin folds in the new-born rabbit, for instance, resembles closely the stripes of type 1.

—*A. H. Schultz.*

Fischer, E. Ueber die Variationen der Hirnfurchen des Schimpansen. Verhandl. d. anatom. Ges., Ergzh., vol. 54, Anatom. Anz., pp. 48–54. 1921.

A study of the fissures in 26 well preserved brains of chimpanzee from the interior of Cameroon. The most interesting result is the conclusion that the brain of the chimpanzee is fully as variable as that of the white man. As in the human brain, the Sylvian fissure in chimpanzee is longer on the left side than on the right; only four brains showed a reverse relation.

—*A. H. Schultz.*

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——— Joel Asaph Allen. Science, n.s., vol. 54, pp. 397–402. October 28, 1921. (An account of the life and work of Doctor Allen, 1838–1921.)

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Bailey, Bernard. An addition to the mammalian fauna of Minnesota. Fins, Feathers and Fur, no. 27, p. 8. September, 1921. (Records *Perognathus flavescens perniger* from Sherburne County.)

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